[002] FIELD OF THE INVENTION

[003] The present invention concerns an automatically shiftable motor vehicle transmission of planetary design~~, according to the preamble of Claim 1~~.

[004] BACKGROUND OF THE INVENTION

[008] A further planetary transmission of this kind is known, for example, from U.S. ~~Pat.~~ Patent No. 4,070,927, the number of available forward gears being in each case one greater than the number of frictional or shifting elements. Each gear change between the forward gears is achieved by respectively switching one of the frictional or shifting elements in or out.

[014] ~~This object is achieved, according to the present invention, by the features of Claim 1. Further advantages and advantageous embodiments are evident from the dependent claims.~~

At this point, and before entering the following descriptions, it must be noted that certain of the following descriptions refer to "minus transmissions" or "minus planetary transmission", which are also commonly referred to in the relevant arts as "planetary-minus-gear sets", and to "plus transmissions" or "plus planetary transmissions", which are also commonly referred to as "plus-planetary-gear sets". Although these terms are well known and commonly used terms of art in the relevant arts, a brief description of these terms will assist in understanding the full meaning of the following descriptions. In brief a planetary gearset or transmission is a planetary-minus-gear set or a planetary-plus-gear set when the planetary carrier is fixed and the sun gear is driven by an input speed in a defined direction of rotation. If the ring gear rotates, as a result of the sun gear rotation, in the same direction as the sun gear, then the planetary gear set is referred to as a planetary-plus-gear set or a plus-transmission. If the ring gear rotates, as a result of the sun gear rotation, in the direction opposite to the rotation of the sun gear, then the planetary gear set is referred to as a planetary-minus-gear set or a minus-transmission. In a

typical implementation of a minus-transmission or a plus-transmission and, for example, the transmission or gear set is a double pinion type planetary gear set having a sun gear, a ring gear and two sets of planetary pinions wherein the first set of planetary pinions intermesh with the sun gear and the second set of planetary pinions while the second set of planetary pinions intermesh with the first set of planetary pinions and the ring gear. The terms, therefore, effectively describe a single pinion type planetary gear set having a sun gear, a ring gear and only one set of planetary pinions. It is well known, however, that there are several other types of planetary gear sets that can be referred to as a "planetary-plus-gear set" or a "planetary-minus-gear set. For example, a planetary gear set having a single sun gear, a single ring gear and an odd number of planetary pinion sets may be referred to as a "minus-transmission", while a similar gear set having, however, an even number of planetary pinion sets, may be referred to as a "plus-transmission".

[015] SUMMARY OF THE INVENTION

[023] BRIEF DESCRIPTION OF THE DRAWINGS

[024] The invention will now be described, by way of example, with reference to the accompanying drawings in which:

[030] Fig. ~~[[5]]~~ 6 schematically depicts a variant component arrangement for the transmission depicted in Fig. 3.

[031] DETAILED DESCRIPTION OF THE INVENTION

[044] Fig. 5 schematically depicts an example of a variant component arrangement for the transmission depicted in Fig. 1. The kinematic coupling of the three planetary gear sets P1, P2, ~~[[P2]]~~ P3 and the six shifting elements 03, 04, 05, 14, 15, 24 is thus carried over without change from Fig. 1. As already mentioned, in contrast to Fig. 1 input drive AN and output drive AB of the transmission now run coaxially with one another. Input drive AN of the transmission is therefore arranged on the side of first planetary gear set P1 facing away from the second (middle) planetary gear set P2, and output drive AB of the transmission is located on the side of the transmission opposite input drive AN, i.e. on the side of third planetary gear set P3 facing away from the second (middle) planetary gear set P2. Clutch 14, with which shaft 4 is connectable to input drive shaft 1, is now arranged axially between the two planetary gear sets P1 and P2. The other two clutches 15 and 45, and also the two brakes 04 and 05, are arranged on the input drive side of the transmission, i.e. on the side of first planetary gear set P1 facing away from middle planetary gear set P2. Brake 05 is arranged adjacent to the input-drive-side outer wall of housing G. The two clutches 15 and 45 are arranged adjacent to one another, clutch 45 being arranged closer to planetary gear set P1 than is clutch 15. In the example depicted in Fig. 5, clutch 45 and brake 04 are arranged in three-dimensional terms adjacent to first planetary gear set P1.

[047] Lastly, Fig. 6 schematically depicts an example of a variant component arrangement for the transmission depicted in Fig. 3. The kinematic coupling of the three planetary gear sets P1, P2, ~~[[P2]]~~ P3 and the six shifting elements 03, 04, 05, 14, 15, 24 is thus carried over without change from Fig. 3. As already mentioned, in contrast to Fig. 3 input drive AN and output drive AB of the transmission run coaxially with one another. In addition, all the shifting elements (04, 05, 14, 15, 24) with the exception of brake 03 are now arranged on the input drive side of the transmission, i.e. on the side of first planetary gear set P1 that is located opposite second planetary gear set P2. Clutch 24, with which output drive shaft 2 is additionally connectable to shaft 4, is adjacent to first planetary gear set P1. The two clutches 14 and 15, in particular their disc packets, are

arranged next to one another, clutch 14 being adjacent to the input-drive-side outer wall of housing G. The two clutches 14, 15 can also be grouped together as a pre-assemblable subassembly, in particular having one common disc carrier. In another embodiment, provision can also be made, for example, for the two clutches 14, 15 to be arranged nested one inside another, clutch 14 being arranged completely inside a clutch space that is formed by the common disc carrier for both clutches 14, 15. The discs of clutch 15 can be arranged in three-dimensional terms radially above the discs of clutch 14, but also axially next to the discs of clutch 14. Brakes 04 and 05, arranged axially between the two clutches 15 and 24 in the example of Fig. 6, can also, in a different component arrangement configuration, be arranged in three-dimensional terms radially above the planetary gear sets.